

Guneet Singh Dhillon

Curriculum Vitae

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Education

- Aug 2014 - May 2018 **University of Texas at Austin**, Austin, TX
B.Sc. in Computer Science with Honors (Turing Scholars Honors)
B.Sc. in Mathematics with Honors **GPA: 3.89 / 4**
 - **Honors Thesis**: Training Ising Models on Images using Sparsitron (Advisor - Dr. Adam Klivans)
 - **Certificate** : Applied Statistical Modeling
 - **Minor** : Economics
 - **Programs** : Freshman Research Initiative, Directed Reading Program

Work Experience

- Jul 2018 - Current **Applied Scientist I & II**, *Amazon Web Services, Inc.*, Pasadena, CA
 - Devised the algorithm *Transductive Fine-tuning* for few-shot image classification, with Dr. Stefano Soatto (paper under review)
 - Devised algorithms that are being used in the *Amazon Textract* product (link)
 - Key-value pair detection: question-answer pairs in forms (e.g. "name" – "Guneet")
 - Table detection: tables and corresponding table cells
- May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services, Inc.*, Palo Alto, CA
 - Devised the algorithm *Stochastic Activation Pruning* for robust image classification, with Dr. Anima Anandkumar (ICLR publication)
 - Implemented the algorithm from *Dense-Sparse-Dense Training for Deep Neural Networks* in MXNet
- May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX
 - Used probabilistic non-negative matrix factorization and Gibbs sampling techniques to build a search and recommendation system, with Dr. Ayan Acharya
- Jan 2016 - May 2016 **Undergraduate Learning Assistant**, *University of Texas at Austin*, Austin, TX
 - Held office hours for the course *Matrices and Matrix Calculations* taught by Dr. John Gilbert
- May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX
 - Implemented a Windows 10 Universal App. to connect and share features between multiple devices

Research Papers and Theses

- Dec 2019 **Guneet S. Dhillon**, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto. **A Baseline for Few-shot Image Classification**, (pdf). *Under review at the International Conference on Learning Representations (ICLR), 2020; Short version in Proc. of the Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS), 2019.*
- Mar 2018 **Guneet S. Dhillon**, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar. **Stochastic Activation Pruning for Robust Adversarial Defense**, (pdf). *In Proc. of the International Conference on Learning Representations (ICLR), 2018; Short version in Proc. of the Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS), 2017.*
- May 2018 **Guneet S. Dhillon**. **Training Ising Models on Images using Sparsitron**, (pdf). *Undergraduate Honors Thesis (Advisor: Dr. Adam Klivans), 2018.*

Research Projects

- Jan 2016 - Dec 2017 **Clustering and Prediction in Time-series Data**, with Dr. Sinead Williamson
Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques

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| Nov 2017 - Dec 2017 | Generative Adversarial Networks (GANs) for Adversarial Training , (pdf), course project Robust image classification using a generator-discriminator formulation to train deep learning models |
| Nov 2016 - Dec 2016 | Conflict Graphs for Parallel Stochastic Gradient Descent , (pdf), course project Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training |
| Jan 2015 - May 2015 | Genetic Algorithms for Efficient 3D Printing , course project Minimizing the overhang region in 3D printing using genetic algorithms to find optimal slicing planes |
| Apr 2015 - May 2015 | Efficient Thread Scheduling , course project Reducing the wait-time for threads by scheduling them based on past CPU and I/O time |

Talks and Presentations

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| Dec 2019 | A Baseline for Few-shot Image Classification , at the Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS), 2019 (upcoming) |
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Coursework

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| Graduate Courses UT Austin, 2016-17 | Convex Optimization (Constantine Caramanis), Numerical Analysis: Linear Algebra (George Biros), Linear Models (Peter Müller) |
| Undergraduate Courses UT Austin, 2014-18 | Honors Statistics: Honors (James Scott), Introduction to Data Mining (Adam Klivans), Algorithms and Complexity: Honors (Eric Price), Geometric Foundations of Data Science (Chandrajit Bajaj), Introduction to Stochastic Processes (Stephen Walker), Machine Learning / Vision: Honors (Kristen Grauman), Artificial Intelligence: Honors (Peter Stone), Computational Intelligence in Game Research I & II (Cem Tutum), Introduction to Quantum Information Science (Scott Aaronson), Randomized Algorithms (David Zuckerman), Differential Equations with Linear Algebra: Honors (Dan Knopf), Real Analysis I (Hector Lomeli), Introduction to Probability and Statistics (Sinead Williamson), Matrices and Matrix Calculations (John Gilbert), Financial Economics (Svetlana Boyarchenko), Introduction to Game Theory (Dale Stahl), Microeconomic Theory (Gerald Oettinger), Discrete Mathematics: Honors (Isil Dillig), Data Structures: Honors (Calvin Lin), Principles of Computer Systems: Honors (Ahmed Gheith), Computer Organization and Architecture: Honors (Ahmed Gheith), |
| Audited Courses Caltech, 2018-19 | Linear Algebra and Convexity (Joel Tropp), Foundations of Machine Learning (Anima Anandkumar) |

Honors and Awards

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| Aug 2017 - May 2018 | Out-of-State Tuition Waiver, CNS, UT Austin |
| Aug 2017 - May 2018 | Thomas and Elizabeth Merner Scholarship in Natural Sciences, CNS, UT Austin |
| Aug 2017 - May 2018 | Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Dept. of CS, UT Austin |
| Aug 2016 - May 2017 | Motorola Endowed Scholarship, Dept. of CS, UT Austin |
| Aug 2015 - May 2016 | Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Dept. of CS, UT Austin |
| Aug 2015 - May 2016 | General Financial Aid Scholarship, International Student and Scholar Services, UT Austin |
| May 2015 - Aug 2015 | TIDES FRI Summer Research Fellowship, CNS, UT Austin |
| Aug 2014 - May 2015 | Freshman Scholarship, CNS, UT Austin |
| Aug 2014 - May 2015 | Schein Memorial Scholarship, Dept. of CS, UT Austin |

Other Activities

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| Jan 2014 - May 2018 | Member of the Sikh Student Association, UT Austin |
| Aug 2014 - May 2018 | Member of the Turing Scholars Student Association, UT Austin |
| Aug 2016 - May 2017 | School Relations Director for the Undergraduate Machine Learning Labs, UT Austin |
| Oct 2016 | Participated in the Electronic Trading Challenge, UT Austin; Secured seventh position |
| Jan 2015 - May 2016 | Member of the Texas Table Tennis Team, UT Austin; Secured an NCTTA Rank of 689 |
| Feb 2016 | Participated in the dataHACK, UT Austin; Secured fourth position and an honorable mention |
| Aug 2014 - Dec 2015 | Member of the Longhorn Cricket Club Team, UT Austin |